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A New Procladius Species with Description of the Immature Stages (Dipt.: Chironomidae)*

SELWYN S. ROBACK, Curator, Department of Limnology, Academy of Natural Sciences of Philadelphia

The species here described was originally found in a collection of *Stictochironomus annulicrus* Townes, sent to the author for determination by Dr. J. Wilhm, of the Oak Ridge National Laboratory, Tennessee. Dr. Wilhm was kind enough to go back to the spring where the adults were collected and send the author a lot of live *Procladius* larvae from the spring. Some of these (♂, 2 ♀♀) were reared to the adult stage in the laboratory and confirmed the immature-adult association. A great many of the larvae pupated but there was a high mortality in this stage and only a few adults emerged. It gives me great pleasure to name this species after Dr. Wilhm. I should like to thank Dr. Eleanor Slifer for advice on the sensory hairs. The figures were done by Mr. Robert P. Moore, Jr.

Procladius wilhmi n. sp.

On the basis of the denticulate extension of the median internal strut (Fig. 6) this species is related to *P. denticulatus* Sublette. It differs in the greater extent of the denticles and the shorter heel of the dististyle. The dististyle (Fig. 7) is more like that of *P. freemani* Sublette which lacks the denticulate median strut.

Male.—Head brown, postoculars (Fig. 4) uniserial mesad of

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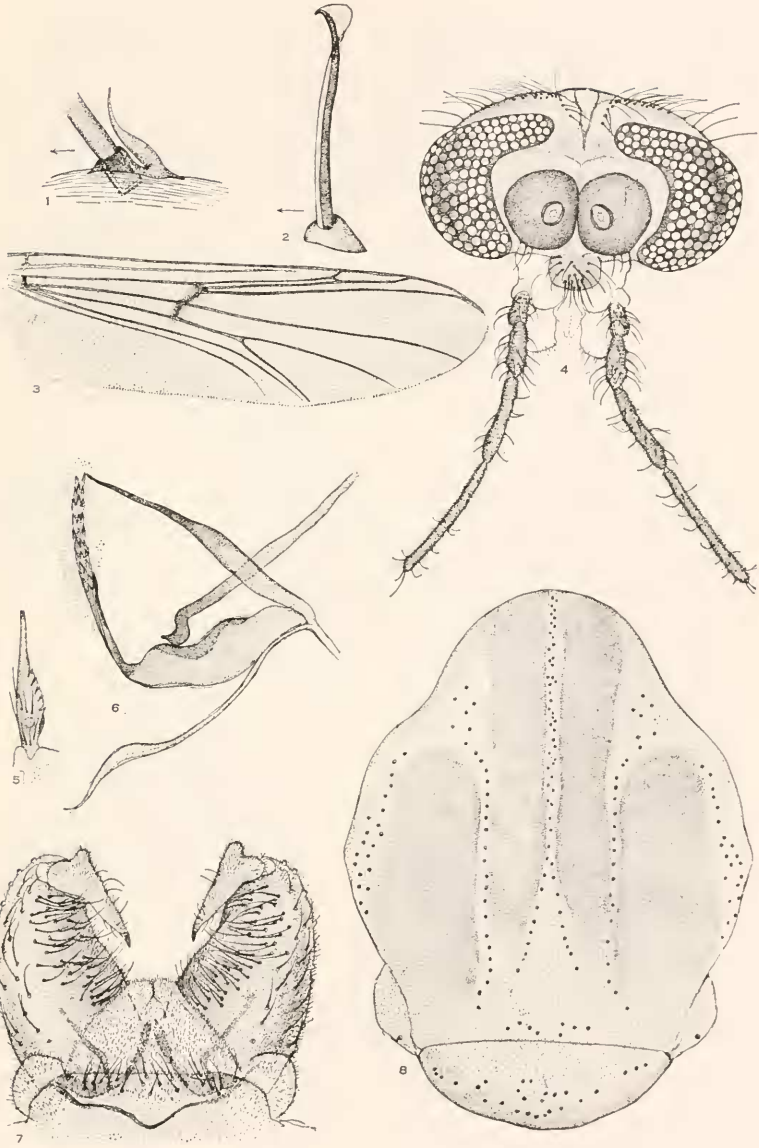
dorsal eye extensions, multiserial behind eyes; ratio of dorsal eye extension to interocular space 1; antennal pedicel dark brown with 3 latero-ventral hairs; antennal ratio 1.97–2.01; ratio of palpal segments 15–24–36–60; pronotum brown with latero-ventral patch of hairs; mesonotum (Fig. 8) lightly pollinose, brown; vittae brown, moderately distinct; humeri and supraalar areas lighter; humeral bristles 7–9; supraalars 22–25; postalars 1; prescutellars 7–9; dorsocentrals uniserial; legs brown; LRI .85–.87; LRII .70–.75; LRIII .73; tibial spur leg I (Fig. 5) 67 μ with 5 lateral teeth; spurs of tibia, leg II 58, 46 μ with 5 lateral teeth each; spurs of tibia, leg III 74, 48μ with 6 lateral teeth each; comb of tibia III with 13 spines; preapical spurs present on T_1 of legs I, II, III and on T_2 of legs II, III; pulvilli absent; empodium well developed; claws spatulate apically; enlarged base of claw with one large and 3 small teeth; no beard on leg I; wing (Fig. 3) 2.6 mm; strongly infuscated, with brownish cast; *r-m* slightly darkened; ratio Cu_2-petiole *Cu* 1.25; *m-cu* one-third arculus to wing tip; halteres light; abdomen black-brown; densely haired; ninth tergite with 21 ± hairs; genitalia (Fig. 7) dark; basistyle 250 μ long; dististyle 118 μ; heel of dististyle 22.5 μ–24.5 μ; ratio of dististyle length to heel length 4.9–5.1; struts of genitalia as in Fig. 6; mesal strut antero-mesally extended; joins elongate row of spurs along a diagonal curving suture; spines embedded in membrane but join strut along this suture.

Female.—Head brown; postoculars completely multiserial; antennal flagellum 12-segmented; rato of apical 5 segments 7–8–10–10–35; last 3 segments (Fig. 9); ratio interocular space to dorsal eye extension 2.6; palpal segments in ratio 15–25–40–72; thorax as in male; LRI .69; LRII .63; LRIII .64; claws apically sharp; wing 2.7 mm; abdomen brown; spermathecae (3) 88 × 102 μ; eighth sternite with mesal light area.

Holotype ♂ emerged March 20, 1966. Allotype ♀ emerged March 17, 1966. Paratypes, 2 ♂♂ September 13, 1965 (Coll.

FIGS. 1–8. *Procladius wilhmi* n. sp. ADULT. 1. Socket of tactile hair, mesal edge, first tarsal segment. 2. Chemosensory (?) hair, base of mesal edge, first tarsal segment. 3. Wing. 4. Male head. 5. Spur, tibia I. 6. Detail struts. 7. Male genitalia. 8. Thorax, dorsal.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Wilhm). Paratype ♀ emerged March 17, 1966. Type locality TENNESSEE 80° 19′W, 35° 54′N. All specimens in collection of Academy of Natural Sciences of Philadelphia.

Larva.—Length, 7.2 mm; head (Fig. 13) 650–700 μ long, greatest width 600–650 μ, 480 μ high; ratio length to width 1.04–1.13; labrum and sensory projections as in Fig. 10; antenna 168 μ long, slightly longer than mandible; ratio 63–10–1.5–1.0 to 63–8–1.5–1.5; basal segment (Fig. 18) 4.3–5.0 as long as apical segments; sense pit .70 from base of basal segment; detail of apical segments, Fig. 17; mandible (Fig. 12) 148 μ long; maxillary palpus 48 μ long by 15 μ wide; sense pit .6 from base; labial plate as in Fig. 14; paralabials generally with 7 teeth; hypopharynx as in Figs. 15, 16; glossa 5-toothed; paraglossae (Fig. 11) 49 μ long with 1–2 inner teeth and 4–5 outer teeth; suspensorium of hypopharynx with 10–12 teeth on each side; body pale orange-brown with scattered opaque white flecks; prothoracic segments bare; mesothorax with some hairs anterolaterally and 2 hairs behind these; metathorax with a lateral hair row in anterior half of segment; abdominal segments 1–6 with lateral hair row; anal papillae 175 μ long by 64 μ wide; 15 apical filaments and one lateral hair; tenth tergite with a pair of long hairs; anal gills (4) conical, uppers 324 μ, lowers 178 μ; claws of prolegs all pale brown, 5 shorter, hook-shaped, and 10 longer, more linear; each anal leg with an elongate simple hair.

Pupa.—♂ 5.4 mm, ♀ 5.6 mm; respiratory organ (Figs. 21, 22) 420–480 μ long by 150–200 μ wide; depth about 120 μ; Mth_1 narrow, pointed, about 12 μ long; Mth_3 elongate, flattened, about 116 μ; Mth_2 not discernible; Oth_1 and Oth_2 elongate, flattened, about 84μ; scar of tergite 1 (Fig. 25) 220 μ long; abdominal integument covered with scale-like spines (Fig. 23); hairs of abdominal segments 5 as in Fig. 24; L_1 and L_2 about 48 μ; D_1 30 μ; D_2 101 μ; D_3 and D_5 about 120 μ; D_4 about 60 μ; V_1 84 μ; V_2 42 μ; abdominal segments 2–7 similar to

FIGS. 9–18. *Procladius wilhmi* n. sp. FIG. 9. Apex adult female antenna. FIGS. 10–18. LARVA. 10. Labrum. 11. Paraglossae. 12. Mandible. 13. Head, dorsal. 14. Labium and paralabials. 15. Hypopharynx, lateral. 16. Hypopharynx, dorsal. 17. Detail of antennal apex. 18. Antenna.


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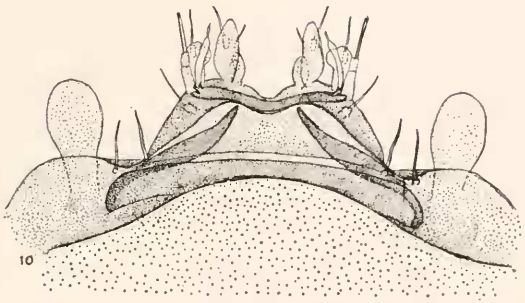
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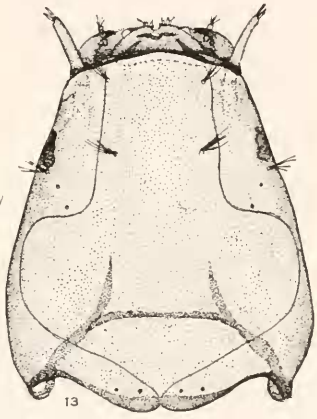
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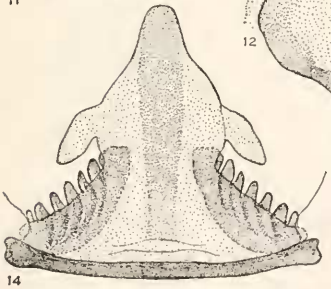
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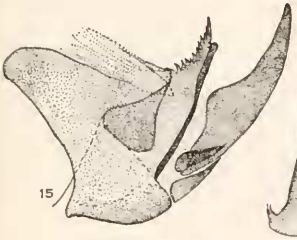
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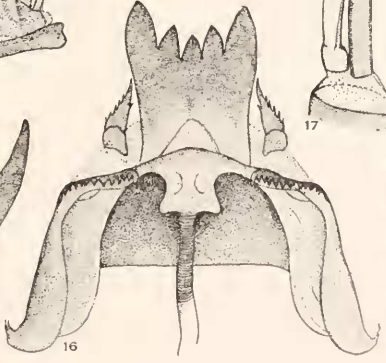
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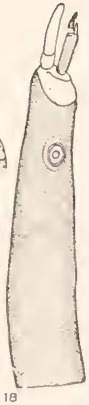
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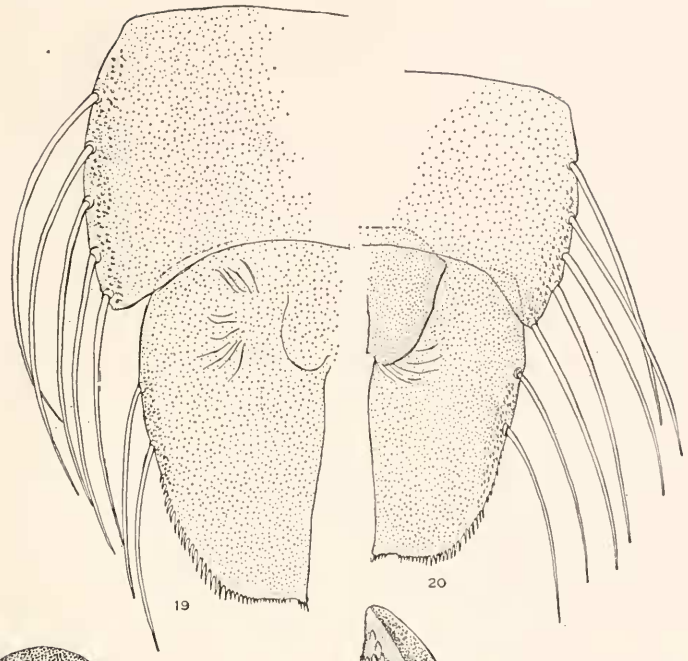
Fig. 24; mesal. two-thirds of abdominal segments brown; segment 7 with 4 long lateral filaments (480 μ) in apical half; segment 8 as in Figs. 19, 20; filaments about 520 μ; integument spinose above lateral filaments on segment 8 and anal fins; male anal fins 580 μ long (Fig. 20); female 650 μ (Fig. 19); about 42 spines on caudo-lateral margin of anal fins, longest at bend and apex.

(*Ecological Data.*—Pool 15 meters long, 1.29–9.14 meters wide, .45 meters deep; bottom *Spirogyra* covered; discharge 0.0028 m^3/sec; current 0.15 cm/sec; temperature 16.1° C (relatively constant); D.O. 8.48 ppm; alkalinity 110 ppm.

Tarsal Sensory Hairs.—Fittkau (1962) illustrates an unusual sensory hair on the mesal side of the first tarsal segment of the female leg II of *A. plumipes*. On the females of *P. wilhmi* I found similar hairs (Fig. 2) near the base of the first tarsal segment on legs II, III of the female. There were none on leg I. Unlike *Anatopynia plumipes* where they are in an irregular group , on *P. wilhmi* they are in a straight row of 5–7 hairs. On the males there were none on legs I or III but the first tarsal segment of leg II bore a single such hair. The structure of the hair with its apparent double lumen is very similar to the chemosensory hairs of the blowfly, figured by Dethier (1955, Figs. 1, 2). The possible function of a chemosensory hair at the mesal base of the first tarsal segment is not at all clear nor why its presence is apparently associated with the female sex.

Another interesting structure which may be sensory is shown in Fig. 1. It appears to be a basal tapering sinuate extension of the socket of the tactile hairs of the first tarsal segment of both sexes. It is found only associated with those tactile hairs along the entire length of the mesal side of the first tarsal segment. They are found on all legs of both sexes. On the male, they appear to be present on the second tarsal segment, though in more rudimentary form. Whether this extension serves as

FIGS. 19–25. *Procladius wilhmi* n. sp. PUPA. 19. Apex abdomen, female. 20. Apex abdomen, male. 21. Respiratory organ. 22. Detail of apex of respiratory organ, lateral. 23. Spines of abdominal tergites, detail. 24. Diagrammatic chaetotaxy of fifth abdominal segment; D, dorsal; V, ventral. 25. Scar of first abdominal tergite.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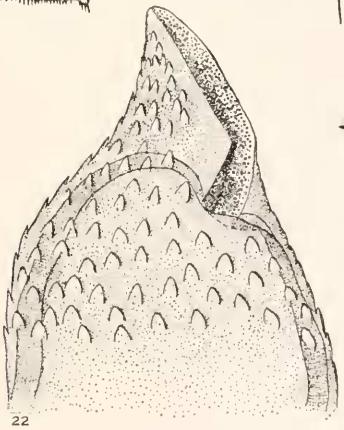
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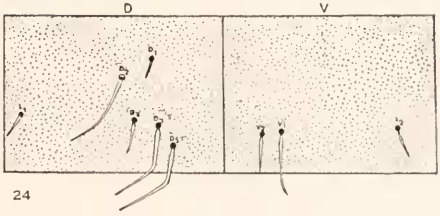
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merely a physical backstop for the tactile hair or has a sensory function cannot be determined without histological study.

In addition to the above, the tarsi bear, scattered over the surface, elongate tactile hairs; recurved, blunt tipped chemosensory hairs, and microtrichiae. The lengths of all these hairs or structures are as follows: tactile (average), 58 μ; recurved chemosensory, 38 μ; hooked chemosensory (Fig. 2), 22 μ; sinuate socket extensions (Fig. 1), 14 μ; microtrichiae, 4.8 μ.

Systematic Position of Procladius.—Fittkau (1962) places *Procladius* in his tribe Macropelopiini primarily on the evidence of the immature stages. While the immatures do show a close relationship to *Apsectrotanypus, Macropelopia,* etc., a comparison of the figures here with those given by Fittkau (1962) for *A. plumipes* will show that the immature stages of *Procladius* are as close or closer to *A. plumipes* than they are to the other Macropelopiini. The shape of the anal fins (Figs. 19, 20) the scalelike spines of the abdomen (Fig. 23), the structure of the labrum (Fig. 10), antenna (Figs. 17, 18), and the labial plate and mandible (Figs. 12, 14) show a very close correspondence with the same structures in *A. plumipes*—more so than to those structures in the Macropelopiini.

The adult, on the other hand, is quite specialized and has diverged more from the anatopyniine stem in the wing venation, genitalic structure and chaetotaxy than the macropelopiine adults. While both *Procladius* and the other macropelopiine genera are closely derived from the anatopyniine stem, the other macropelopiine genera appear to be more closely related to each other, as a group, than they are to *Procladius.* This suggests that if *Procladius* is to be retained in the Macropelopiini it should be given equal subtribal rank with the other genera as a group.

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